Draft Isles of Scilly Local Plan 2015 – 2030

Including Minerals and Waste

Infrastructure Capacity Assessment 2018

Council of the ISLES OF SCILLY

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Council of the Isles of Scilly
Draft Local Plan
The Infrastructure Department
Town Hall
St Mary's
Isles of Scilly
TR21 0LW
infrastructure@scilly.gov.uk

Contents

List of Figures

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Introduction

1. This Infrastructure Capacity Assessment has been produced by the Infrastructure Department of the Council of the Isles of Scilly as the Waste Authority and Water Authority for the islands and focuses on the existing capacity of waste collection and disposal and the management of water systems. It also identifies future investments that are likely to take place over the period of the Local Plan (2015-2030).

2. A sound Local Plan sets out how the objectively assessed development and infrastructure needs of an area can be met. Planning for growth and change requires a strategic understanding of the opportunities and constraints in a given area. It is important that infrastructure provision both shapes future development patterns and enables the delivery of sites within that pattern of growth.

3. The National Planning Policy Framework (NPPF) states that Local Plans should "*plan positively for the development and infrastructure required in an area and to achieve this… assess the quality and capacity of infrastructure and its ability to meet forecast demands*". The emerging Draft Local Plan seeks to strategically plan to meet the local housing needs, as established by the 2016 Strategic Housing Market Assessment (SHMA)[1], which identified a housing need of 105 new homes over the plan period (2015-2030).

4. The Local Plan makes allowances for various methods of delivering affordable homes on the basis of viability, which could result in a number of open market houses coming forward. The Housing Viability[2] work suggests that up to 50% open market housing could be required to enable the delivery of affordable homes. As such, the requirement for 105 affordable homes over the plan period could result in the delivery of around157 new homes in totality. There are no specific proposals or allocations for other forms of development such as commercial, social or employment development. It is therefore necessary to consider the implications of specific new housing over the plan period and whether the capacity of the islands infrastructure is adequate or whether new facilities or improvements are required.

5. This report seeks to establish and clarify the existing physical infrastructure of the Isles of Scilly and make policy recommendations to inform the Local Plan 2015-2030. Physical infrastructure relates to a range of important services required to support communities including energy, drinking water, waste water, waste management and telecommunications. Infrastructure on the islands is provided by the Council in relation to waste management across the islands (with the exception of commercial waste on Tresco), drinking water on St Mary's and Bryher and mains sewerage for parts of St Mary's, most notably Hugh Town and Old Town. Drinking

1 http://www.scilly.gov.uk/sites/default/files/planning-apps/Isles%20Of%20Scilly%20Final%20SHMA%20Report%202016.pdf

2 http://www.scilly.gov.uk/sites/default/files/planning-apps/Housing%20Viability%20Assessment%20Council%20of%20Isles%20of%20Scilly%20-%20Final%20Report%20March%202018.pdf

water and sewerage on Tresco is provided by the Tresco Estate. Drinking water on the islands of St Agnes and St Martins is provided either by the Duchy of Cornwall or from private supplies. Waste water on Bryher, St Agnes, St Martins and St Mary's in those locations where mains drainage is unavailable is treated through private systems, some of which are managed by the Duchy of Cornwall.

6. The provision of Energy and Telecommunications infrastructure on the islands is provided by Western Power Distribution and BT respectively. Western Power Distribution and BT are consulted on the Draft Local Plan, as statutory consultees. Their views therefore are feed in to the process and will not be addressed in this topic paper.

7. The purpose of this assessment will:
    - assess the capacity of the islands infrastructure with a particular focus on waste, drinking water and waste water; and
    - inform the Council's selection of a preferred development strategy and identification of development sites to take into account the capacity of existing infrastructure and/or planned investments in new or improved infrastructure to support development.

8. The Infrastructure Capacity Assessment aims to ensure that infrastructure is appropriately considered as part of the Local Plan. The assessment provides background evidence to inform the preparation of the Local Plan. In particular the assessment:
    - provides an up-to-date understanding of infrastructure services, networks and facilities;
    - identifies current or potential issues about the quality, capacity and availability of existing infrastructure and services on the islands;
    - gathers information about the investment plans of infrastructure and service providers;
    - identifies particular issues in relation to capacity, including the opportunities resulting from new development to improve existing infrastructure.

9. The emerging Local Plan will ultimately be subject to an independent public examination by a Government appointed Inspector who will need to be satisfied that the development proposals are consistent with existing and, where necessary, improved infrastructure and service provision; and that there is a reasonable prospect of new or improved infrastructure being delivered over the plan period.

Infrastructure Policy Context

10. The National Planning Policy Framework (NPPF) 2018 sets out the government's planning policies for England and how these are expected to be applied. Paragraph 16 of the NPPF states that Local Plans should be prepared with the objective of contributing to the achievement of sustainable development and (c) be shaped by early, proportionate and effective engagement between plan-makers and communities, local organisations, businesses and infrastructure providers. Paragraph 20 states that strategic policies should set out an overall strategy for the pattern, scale and qualify of development, and make sufficient provision for (b) infrastructure for…waste management, water supply and wastewater.

11. Paragraph 22 of the NPPF states that strategic policies should look ahead over a minimum 15 year period from adoption, to anticipate and respond to long-term requirements and opportunities, such as those arising from major improvements in infrastructure. It is important to ensure that there is a reasonable prospect that planned infrastructure is deliverable in a timely fashion. The paragraph further states that to facilitate this, it is important that local planning authorities understand development costs at the time Local Plans are drawn up. For this reason, infrastructure and development policies should be planned at the same time, in the Local Plan.

12. The National Planning Policy Guidance (NPPG) states that the Local Plan should aim to meet the objectively assessed development and infrastructure needs of the area. The NPPG goes on to say that, *"a Local Plan is an opportunity for the local planning authority to set out a positive vision for the area, but the plan should also be realistic about what can be achieved and when (including in relation to infrastructure). This means paying careful attention to providing an adequate supply of land, identifying what infrastructure is required and how it can be funded and brought on stream at the appropriate time; and ensuring that the requirements of the plan as a whole will not prejudice the viability of development*."

Statement of Common Ground and Duty to Co-operate

13. One of the requirements of the 2018 NPPF is that a local plan is positively prepared, justified, effective and consistent with national policy. The requirements include that it is deliverable over the plan period, and based on effective joint-working on cross-boundary strategic matters that have been dealt with rather than deferred, as evidenced by the statement of common ground. The Council does not, however, have direct boundaries with other local authorities, due to its geographical isolation.

14. The duty to cooperate was created in the Localism Act 2011, and amends the Planning and Compulsory Purchase Act 2004. It places a legal duty on local planning authorities, county councils in England and public bodies to engage constructively, actively and on an ongoing basis to maximise the effectiveness of Local Plan preparation in the context of strategic cross boundary matters. Local planning authorities must demonstrate how they have complied with the duty at the independent examination of their Local Plans. If a local planning authority cannot demonstrate that it has complied with the duty then the Local Plan will not be able to proceed further in examination.

15. The Council has engaged with neighbouring local authorities to identify key strategic/significant cross boundary infrastructure issues and what implications these may raise for the Local Plan. The Council is committed to involving neighbouring authorities and other duty to cooperate partners throughout the preparation of the Infrastructure Capacity Study.

Overview and Local Context

16. Our remote location and tiny fragmented population means that we face some significant challenges, including the provision of effective infrastructure and which is proportionally more costly to provide than on the mainland. Many of the issues facing the Isles of Scilly are synonymous with other island communities, including high transport and freight costs, limited competition and a population size that is too small to provide economies of scale or generate sufficient income to fund essential services and infrastructure.

17. The population of the Isles of Scilly is seasonal reflecting the influence of tourism. The resident population is approximately 2,250 people, most of whom live on the island of St Mary's. The population swells to around 6,000 in the peak of the summer with the influx of visitors. The pressure and demands on the islands infrastructure is therefore highly variable and needs to accommodate both peaks and troughs.

18. The population of the islands peaked in 2008. Any modest future growth in the resident population resulting from the proposals set out in the Local Plan will in part return to that peak. The 2017 population estimate indicates a population of 2,259, which is 74 less people than the 2,333 population in 2008. This recent decline has fluctuated year on year and diverges from the overall trend since 1991, where there has been a growth of 10 people per year in contrast with the 2008-2017 average being a loss of 8 people a year. This recent decline has clear and significant implications for the sustainability of the economy and services on the islands if it were to continue. In parallel with this population decline, the population of the islands is rapidly ageing with the over 65 age group who represented 25% of the population in 2014 rising to 30% in 2030. By 2030 the working age population of the islands is set to decline from 65% to 54% by 2030.

19. Both the population decline and demographic changes need to be taken into account when assessing the impact of the development strategy set out in the Local Plan.

Furthermore, visitor numbers since over the last decade have been in decline. **Although not entirely attributable to the decline in visitor numbers, since passenger numbers at the Airport peaked in 2002 at 148,346 (with an additional 44,558 passengers flying to and from Tresco), passenger numbers arriving and departing have declined with around 92,000 in 2017/18.[3].**

Figure 1 'Moorwell Alp' 2014 and the Incinerator

[3] Full Council Committee Report (Agenda Item 13) Airport Commercial Fees and Charges 2018/19: http://committees.scilly.gov.uk/documents/g1036/Public%20reports%20pack%2022nd-Mar-2018%2009.30%20FULL%20COUNCIL.pdf?T=10

Waste Management

20. **Introduction** Given its remoteness approximately 45 kilometres from the UK mainland, managing and moving waste from the islands to the mainland, or indeed even within the islands, is expensive and presents practical challenges. As such, it is highly beneficial to move towards the provision of greater on-island waste management solutions (though this is challenging as the resident populations on some of the islands are extremely small).

21. The Council of the Isles of Scilly functions as the Waste Collection Authority (WCA) and Waste Disposal Authority (WDA) for the Isles of Scilly and therefore takes responsibility for managing domestic waste across all of the inhabited islands. Waste management includes the collection and disposal of waste, including reuse and recycling. On St Mary's, the Council provides kerbside collection for both residual waste and recyclables. The Council does not directly collect waste on the off islands as it is considered more cost effective and efficient to contract out these services to businesses or individuals based on these islands.

Figure 2 Legacy Waste being cleared from Porthmellon

22. In addition to managing domestic waste, due to the limited private sector services, the Council also manages the majority of commercial waste across the islands (with the exception of commercial waste on Tresco). The Council recharges businesses and organisations for this service on a cost recovery basis with the establishment of a pre-paid sack system for collections and weighbridge charges for all other waste streams accepted at the waste management site. A prepaid sack system is standard across many Local Authorities and is implemented by trade/commercial businesses paying in advance for trade/commercial waste refuse sacks, the cost of which include transfer and final disposal. This system offers an effective and flexible solution for disposing of waste whilst ensuring compliance with legislation.
All waste is transported to the mainland. The Council has contract arrangements with the Isles of Scilly Steamship Company to transfer all waste and recyclables collected at the waste management site at Porthmellon, to the mainland as well as the collection of all off island waste to St Mary's. The Council also has contract arrangements with a private company, Suez, for a 3 year period. The current contract commenced in May 2017 and will run for 3 years. Suez provide the onward movement and disposal of the islands waste once it arrives on the mainland. Residual waste is disposed of at the 'energy from waste' plant at St Dennis in Cornwall.

23. The Council offers recycling of green garden waste, household DIY materials, cardboard, paper, plastic, glass, tin cans, scrap metals, cooking oil, tyres, batteries and household appliances and electronics. Glass and cans are collected at 'bring sites'. There is also a voluntary sector managed textile recycling bank at one of the bring sites. Household DIY, Green Garden Waste and Glass are processed and reused on the islands. In 2017/18 163 tonnes of glass bottles and jars were received and processed on site. The by-product of the glass recycling process are 4 different grades of aggregates that are used in local projects such as footpaths, non-structural works and drainage. In addition, construction, demolition and green waste is also processed and reused on the islands and managed commercially by island businesses. All other recyclables are sent to various recycling centres in the South West.

24. **Improvements to Waste Management** In 2009 Waste Consultants SLR produced a Waste Strategy[4] for the Isles of Scilly to enable the islands to deal with waste produced. The strategy detailed plans to reduce and manage waste in a more efficient and sustainable manner and to ultimately bring benefit to the community and the environment of the Isles of Scilly.

25. The aims of the Strategy were as follows:

- **Sustainability:** achieving sustainable management of all waste arising on the Isles of Scilly through emphasis on the reduction, re-use, recycling and recovery of waste; and
- **Working together:** developing effective co-operation and joint working between residents, the Council of the Isles of Scilly and businesses to

[4] http://www.scilly.gov.uk/sites/default/files/document/policy-documents/Waste%20Strategy.pdf

maximise the benefits of waste minimisation and increased recycling and recovery.

26. The landscape of waste and recycling in Scilly and UK wide has changed dramatically since the 2009 strategy was developed.

27. The Council's Vision for waste as set out in the 2009 Waste Strategy[5] has been to create a modern integrated waste management system with increased recycling rates and for all non-recyclable waste to be sent for energy recovery. In line with Government policy, the Council is committed the following actions:

- Preventing Waste (Waste Prevention Programme for England);
- Increasing recycling (improving quality, creating a stronger market for materials, making businesses more responsible for what they produce, improving recycling and waste collection from households);
- Identifying on island waste management solutions in the interests of sustainability and to reduce costs of managing waste;
- Supporting energy from waste both in relation to the disposal of residual waste on the mainland as an alternative to landfill and as an on island solution;
- Getting the right infrastructure in place to deal with waste.

28. **Achieved Improvement** In 2011 Defra confirmed their intention to provide £1 million in funding to establish a long-term waste management system for the Isles of Scilly that is environmentally and financially sustainable, technically sound and protects/enhances the sensitive local environment; ensuing statutory targets are met; establishing infrastructure that complies with EU directives; and meets the requirements of the Environment Agency and Defra. Since 2011 using additional Defra funding of around £4m, significant investments and improvements to waste management on the islands has been achieved as highlighted below:

29. **Phase 1- Legacy Waste Removal** In 2014 the Council contracted United Environmental Solutions (UES) Ltd to undertake the removal of waste (bulky and black bag) that had been stockpiled on site.

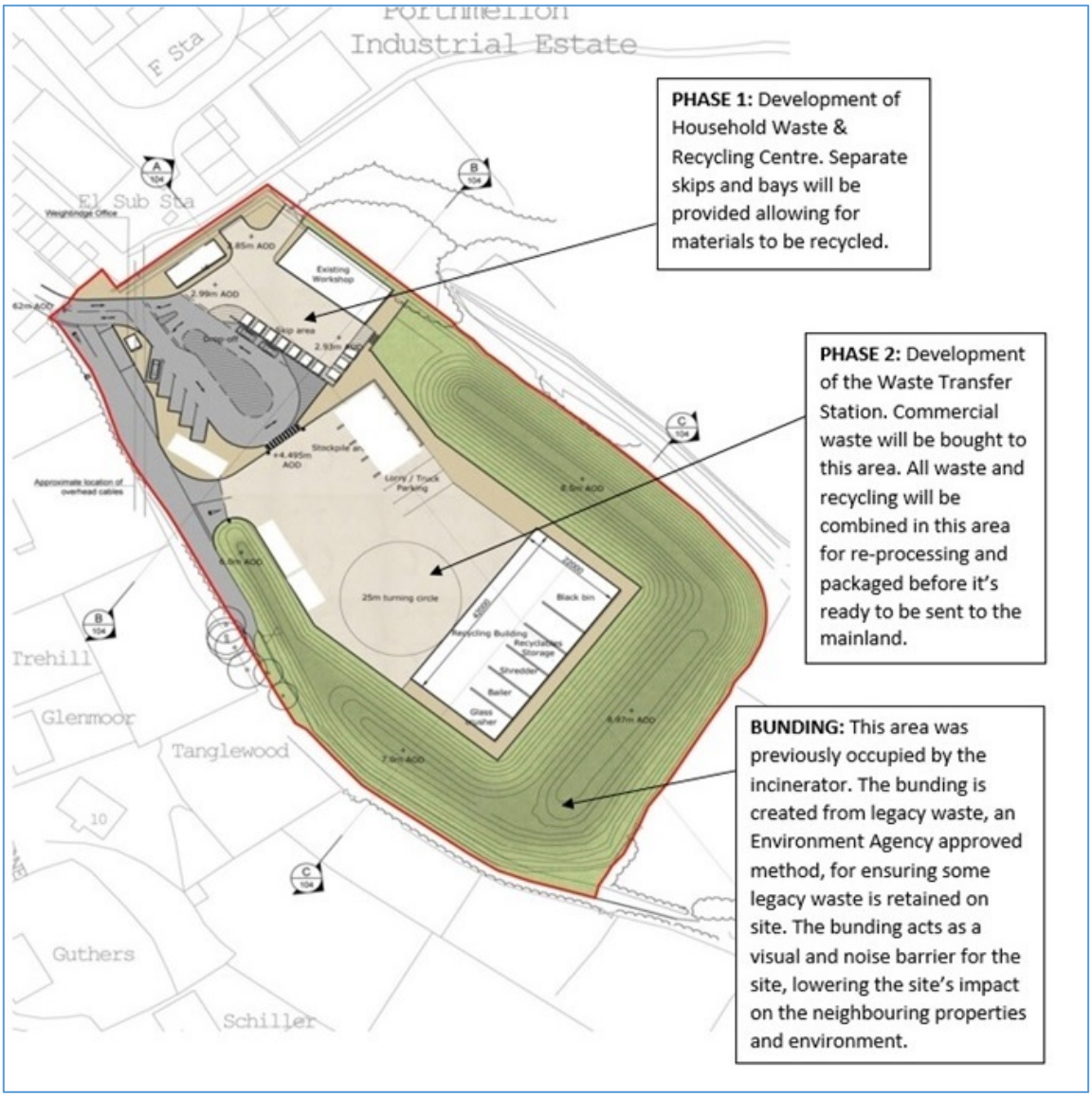

Figure 3 Approved plans for the redevelopment of Porthmellon

30. **Landfill Closure & Waste Recovery Plan** As the Council stored waste on the waste management site at Porthmellon without a permit, the Environment Agency issued a Landfill Closure Notice (LCN) to ensure that further waste deposits would be managed in a way which significantly reduces the risk to the environment. A Landfill Closure Plan (LCP) and a Waste Recovery Plan (WRP) were produced in accordance with the agreed closure. The LCP included provision for ground water and gas monitoring, which are ongoing. The WRP assisted with the Waste Recovery Permit, allowed the Council to deposit waste as a necessary recovery activity (i.e. formation of construction bunds as part of the waste management site's re-development).

31. **Off-Island Improvements** The Council does not directly collect waste on the off islands as it is considered more cost effective and efficient to contract out these services to businesses or individuals based on these islands. Each of the islands has a temporary storage/transfer facility which have been upgraded to provide suitable,

secure facilities for the receipt and preliminary sorting of waste to segregate recyclable materials before it is transported to the waste management site on St Mary's. Suitable skips and containers are provided by the Council. Redevelopment of the St Martin's Waste Management Site and works to clear the Bryher Waste Site were completed in early 2015. New off-island skips and containers were provided to manage waste and recycling more efficiently and effectively. A pilot waste collection service was introduced on St Martin's in 2016. In 2018, the Council contracted with Tresco Estate to provide the domestic waste services on that island, these had previously been excluded. The Council also commenced acceptance of commercial residual waste from Tresco which facilitated the cessation of burning these materials at Tresco Estate's 'dump'.

32. **Reorganisation of Staff** The Council's reorganisation in 2014/2015 resulted in a new Waste & Recycling team, with new roles created to allow for a more focused workforce. A Waste & Recycling Officer, a Waste Site Supervisor and a team of Waste & Recycling Operatives have been appointed to strengthen the services provided for the community. A training programme has been implemented to ensure staff are appropriately qualified, this is through the Waste Management Industry Training Advisory Board (WAMITAB).

33. The Councils Waste & Recycling service is delivered by 7 full time operatives. Additionally, 3 local contractors manage the off islands waste sites (one for each island excluding Tresco who manage their own waste).

34. **Closure of Incinerator** In December 2014 the Council closed the incinerator that had been running since the 1970's, following a closure permit from the Environment Agency.

Figure 4 During redevelopment phase of Moorwell: Source Image Credit: Merryn Smith

35. **Porthmellon Waste Site Re-Development Phase 1: HWRC & Phase 2: Waste Transfer Station** The most significant improvement has been the transformation of the waste management site at Porthmellon, which has been redeveloped to provide a Household Waste Recycling Centre (HWRC) and transfer station. This facility is capable of receiving Council collected materials and as a bring site for householders and commercial operators. The design sought to minimise the removal of legacy materials as part of the redevelopment of the site in accordance with an environmental permit. The redevelopment scheme also included the demolition of the incinerator, removing liability of a derelict facility and maximising available space on site.

Figure 5 the 1970s incinerator during demolition in 2015

36. The transformed site has sufficient space and facilities to process and transfer waste streams arising on the islands. The front of the site operates as a HWRC which is able to recycle the maximum of material delivered by residents. The remainder of the site is laid with concrete to seal as much of the site as possible and divert surface water from the underlying waste materials. The large building at the eastern end of the site contains all residual waste deliveries and waste processing activities with provision for the storage of up to 200 tonnes of baled waste and recyclates. Also provided are open bays for the temporary storage of metals, glass, white goods and possibly construction and demolition waste and green waste awaiting transfer.

37. **Improved waste management** Since 2014 the Council has implemented creative and cost effective measures to reduce, reuse and recycle waste on the islands and opportunities to divert waste. This on-going work has addressed a range of issues, including the following:

    i. Identifying the opportunities to maximise the reuse and recycling of a range of waste materials with the aim of diverting wastes from incineration or landfill, including the feasibility of collecting selected materials at source augmented by effective 'bring' facilities across the islands.
    ii. Identifying opportunities and markets to minimise the cost of managing and disposing of waste, including securing the optimum commercial

contract opportunities for the disposal and transportation of recyclables, hazardous waste and residual waste.

iii. Identifying the requirement for additional vehicles to enable the separation and segregation of recyclable and residual waste streams as well as baling, compaction and containerisation equipment and training required by site operatives to ensure implementation of any measures identified.

iv. A review of waste collection methods, including a rationalisation and review of the collection rounds on St Mary's to facilitate kerbside recycling collection in a cost effective manner.

v. A Total Effective Equipment Performance (TEEP) analysis of the various options for providing a recycling service was carried out which identified a co-mingled collection of metals, paper, card and plastics in a separate sack for both domestic and household customers, as opposed to a segregated option. Glass bottles and jars will continue to be collected using the existing "bring" sites; the locations of these sites will be subject to further review with the potential to provide further sites if they are required.

vi. An assisted collection service aimed at those with a mobility or sensory impairment.

38. The waste management improvements implemented to date have resulted in a significant reduction in waste management costs. In addition to reducing costs and effectively and compliantly managing all waste that comes through the waste management site, there has been a significant improvement in the Council's local authority rankings for recycling waste to being the most improved authority. It is anticipated that recycling rates will increase further following the roll out of dry mixed recycling across the islands, including for the first time a kerbside collection on St Mary's that commenced in December 2018.

39. As indicated in the table below, the volume of waste recorded by the Council increases by approximately 50% in the tourist season:

	Apr – Jun	Jul – Sep	Oct – Dec	Jan – Mar	TOTAL	Diversion %
2016/ 17	474.5	555.2	370.7	334.6	1735	18.8%
2017/ 18	479.2	562.3	305.4	309.7	1656.6	21.5%
2018/ 19	476.7	534.3				*27%*

Figure 6 Volumes of waste collected by the Council 2016 - 2018

40. The volumes of waste and recyclates arising from the islands households and businesses are well within the limitations of the waste site and the environmental permit. The permit allows for 6,500 tonnes of waste to be accepted at the site per annum which far exceeds the maximum received to date. Containerisation methodologies (enclosed compaction skips) also ensure that should there be any

delay in transferring residual waste and dry recyclates to the mainland it is possible to safely and compliantly stockpile fractions until shipping resumes.

Recycling on the Isles of Scilly

REDUCE - REUSE - RECYCLE
IOS WASTE & RECYCLING

October 2018

There has been an overall increase in recycling rates in 2018: the current in-year average diversion rate is 27%. The normal pattern is for an increase in recycling in the summer months, largely as a result of glass bottles and jars, but we still anticipate an overall increase in diversion rates at the end of the year (31 March 2019)

In September 2018, the islands exceeded a 30% recycling diversion rate for the first time (30.01%).

	15/16	*16/17*	*17/18*	*18/19*
April	9.7%	14.7%	20.9%	*23.4%*
May	11.4%	16%	23.3%	*27.8%*
June	8.5%	21.3%	19.3%	*27.8%*
July	14.3%	20.1%	15.5%	*28.3%*
August	21.1%	27%	24.0%	*25%*
September	19.4%	24.1%	23.5%	**30%**
October	17.9%	21.4%	19.2%	
November	15.8%	14.7%	21.3%	
December	12.3%	19.1%	18.6%	
January	13%	18.2%	18.8%	
February	7.5%	14.0%	27.5%	
March	14.7%	15.1%	26.2%	
ANNUAL	***13.8%***	***18.8%***	***21.5%***	***27%***

What is a 'Diversion Rate'? It is the percentage of waste that has been 'diverted' from landfill or incineration and recycled or reused instead.

Figure 7 Publicity Material on Council recycling rates

41. **Industrial Waste** The Council has no legal obligation to provide facilities for the acceptance and processing of industrial waste. The waste management site at Porthmellon does not have the capacity or the facilities to accept these waste streams. The private sector produces and manages these waste streams. Inert construction, demolition and excavation waste is treated commercially for reuse at

Pendrethan Quarry on St Mary's. A good example of re-using construction and demolition waste on-island was the demolition of the former Secondary School at Carn Thomas: https://youtu.be/V8XgzO10MGI

Figure 8 Images of the redevelopment of the waste site at Porthmellon 2015/2016

42. **Tresco** Tresco is owned by the Duchy of Cornwall and leased on a long-term basis to the Tresco Estate. The Estate employs the vast majority of the people who work there, manages the buildings and operates its own waste collection system and management facilities.

43. The collection, storage and processing of waste on Tresco is carried out by a dedicated waste operative. The Estate has a purpose-built collection truck, in which the operative makes daily collection rounds in the summer months, reducing in frequency in the off-season. As well as collecting from households and other premises, there are a number of 'bring sites' on the island where visitors and residents can deposit their waste and recyclates into bins. Collected waste is taken to the on-island waste transfer site.

44. Green waste from Tresco is chipped and mulched and put back onto land. Currently, food waste is deposited into unlined pits. Tresco Estate is therefore in the process of taking steps to develop the food waste management on the island. The Estate is in the process of procuring a food waste bio-processor, also referred to as a 'guzzler',

which turns food waste into a stabilised, low-odour product that has reduced by up to 80% of the original volume. This residue can be used as fuel to supplement a suitable biomass unit or put to other uses such as soil enrichment.

45. **Future options for managing waste** The Council is committed to continually improving waste management services on the islands with the pursuit of creative and cost effective measures to reduce, reuse and recycle waste. In particular, it is committed to working in partnership with the islands communities and businesses to identify on island solutions for managing waste rather than transporting waste and recyclables back to the mainland in the interests of sustainability and to reduce costs.

Key Benefits include:

Improved management of sewage treatment	**Reduces fuel poverty by supplying energy from waste**
Reduces waste disposal costs of exporting to mainland (around a third of waste is organic)	**Generates controllable, energy generation and a district heating opportunity**

46. Consistent with identifying on-island solutions, the Smart Island Programme[6] (an island-wide partnership was established to implement a set of interconnected projects, with the aim to cut electricity bills by 40%, meet 40% of energy demand through renewables and see 40% of vehicles be low carbon or electric by 2025), is looking into the feasibility of establishing an Anaerobic Digester and Gasification plant on St Mary's as an opportunity to improve the management of sewage locally and sustainably. The ambition is to adopt at a multi-utility approach that improves the responsible and sustainable management of waste at lower cost combined with the compliant and effective management of sewage treatment.

47. The Energy Infrastructure Plan (EIP) 2016[7] established that the Smart Island Programme's ambition to achieve 40% of the islands' energy from a renewable source by 2025, would need to be a balanced mix of Photovoltaic (PV) panels, wind generated energy as well as anaerobic digestion (AD) and gasification of waste.

48. **Anaerobic Digestion (AD) and Gasification** AD is a proven technology that processes biological material using micro-organisms in the absence of air. It converts feedstock to biogas which can be used as a fuel for heat or power. The waste product from the process is a digestate, in the form of liquid and solids. The solids can be used as fuel for a gasifier. Critical to the success of an anaerobic digester is the feedstock mix and volumes. The EIP suggested that this would require 150 tonnes per year of green waste, 1000 tonnes per year of food waste and 2000 tonnes per year of sewage. More detailed feasibility work is being carried out on behalf of the Council, which is focused on finding the best solution for the islands. The most likely feedstock is food waste and sewage sludge and some green waste.

[6] https://smartislands.org/about/

[7] http://www.scilly.gov.uk/sites/default/files/IoS_Infrastructure%20Plan_FINAL_IoS.pdf

49. The AD plant can be sized to accommodate the seasonal fluctuations in volumes of waste generated on the islands. It will be important to capture as much food waste from St Mary's as possible, including waste from households, hotels, restaurants, cafes and pubs. It is considered that food waste from Tresco and the off-islands are unlikely to be economically viable to transport to St Mary's. There are proposals to install a food waste bio-processer on Tresco, which could facilitate much improved management of food waste, but will reduce the energy content of the food waste to an extent that it is unlikely to be worthwhile transporting it to St Mary's. This output could be applied to gardens or farmland to improve soil condition and return nutrients to land. Further work is required to determine the most sustainable approach to managing food waste from the off-islands, but the quantities of waste generated there are not required in the feasibility of the St Mary's AD plant.

50. Gasification is a high temperature process in which a solid fuel is converted into a combustible gas. The combustible gas is then converted into heat or power. The gasification plant is likely to utilise solid digestate from the AD facility, as well as providing an energy recovery route for mattresses, carpets, wooden pallets and other similar wastes. This process will further reduce off-island waste export, while also recovering energy from these wastes.

51. In order to make sure we build the right size of facility that works with the feedstock we intend to use, further detailed feasibility work is required. There are still questions to answer at this stage including: an assessment of the feedstock mix and seasonal profile; the technical options; the opportunity for co-location and inter-dependencies with other utilities and the most appropriate location. Fundamental issues that need to be addressed are particularly in relation the process of dewatering the digestate from the AD plant as the resulting liquors that would be returned to the new sewage treatment works (STW) would have a significant impact on its operations due to very high levels of ammonia (circa 1000mg/l) (and due to the use of food wastes).

52. Subject to its feasibility, the intention is that the Isles of Scilly Community Venture will manage the anaerobic digester and gasifier generating income for the community through gate fees and the production of energy. The Community Venture is a not-for-profit community interest company established in 2018. The Community Venture sells energy generated by the solar panels and recycles the income to reduce electricity bills for all islanders through a special Isles of Scilly energy tariff, in a partnership with not-for-profit licenced energy provider, Our Power.

53. If the feasibility of the innovative multi-modal approach outlined above proves to be unfeasible, other options will be pursued including the viability of using only food waste for AD, the viability of using only Gasification (or a similar thermal process) for food waste and dried sewage sludge, along with other wastes (e.g. mattresses & carpet etc.), or simply treating organic waste streams through in-vessel composting.

54. **Future Growth Implications for Waste Management** The emerging Local Plan is planning for modest levels of development over the plan period with a focus on meeting the needs of the community and addressing demographic imbalances rather than encouraging population growth. Over the past decade, the islands have

also experienced both a decline in its resident population and the number of visitors. Based on the strategy set out in the Local Plan, any increase in the population of the islands by 2030 is likely to be marginal compared to the peak population in 2008. Similarly, it is unlikely that the strategy of the Local Plan in itself will mean that visitor numbers will increase to the levels experienced at the start of the millennium.

55. The capacity of the islands waste management services have increased since 2014 on the basis of the considerable investments and improvements to waste management infrastructure and practices. Specific data on capacity is difficult to quantify on the basis that there was no weigh-bridge on site until 2014. However, it is considered that the waste management site at Porthmellon, along with current services including transportation between the islands and back to the mainland, have sufficient capacity and resources to accommodate any additional waste and recyclables generated by the addition of up to 160 new homes over the Local Plan period. Similarly, there is also considered to be sufficient capacity and resources to accommodate potential additional waste generated by any increased economic activity, including an increase in visitor numbers.

56. As a worst case scenario 160 homes would increase the total amount of waste by 265 tonnes. However, this crude and worst case scenario does not take into account the fact that many of these new homes will be occupied by those currently living on the Isles of Scilly and that a significant amount will be small households based on demographic projections as set out in the Strategic Housing Market Assessment (SHMA). Indeed based on the SHMA, including the updated work, the current population of 2,259 would be expected to increase to around 2,410 by 2030 - an increase of around 150 (7%). Again rather crudely and based on average amounts of waste produced per person, this population increase would result in an additional amount of waste by 119 tonnes.

57. The Porthmellon waste site, along with the off island facilities, are considered to have sufficient capacity for the interim storage of both residual waste and recyclables, including at the height of the summer season. Waste reduction strategies and increased recycling will also mean that residual waste will be more concentrated and therefore easier to store and to transport off the islands reducing the likelihood of amenity and environmental issues, including odour, wind borne litter and vermin and seagulls (particularly as waste is now stored within a building rather than being stockpiled outside). Capacity will further increase with the implementation of new initiatives that enable the management of waste streams on the islands thereby reducing reliance on mainland disposal.

58. The management of waste is considered to be adequate without requiring new development to contribute to improving waste management services or infrastructure. In addition, the policies in the new Local Plan are sufficient to mitigate any impacts of waste both during construction and when being used by ensuring that the waste hierarchy is adopted (with an emphasis of reusing construction, demolition and excavation waste) and requiring appropriate external storage for waste and recycling, with larger development scheme incorporating new ‘bring sites’ for recycling.

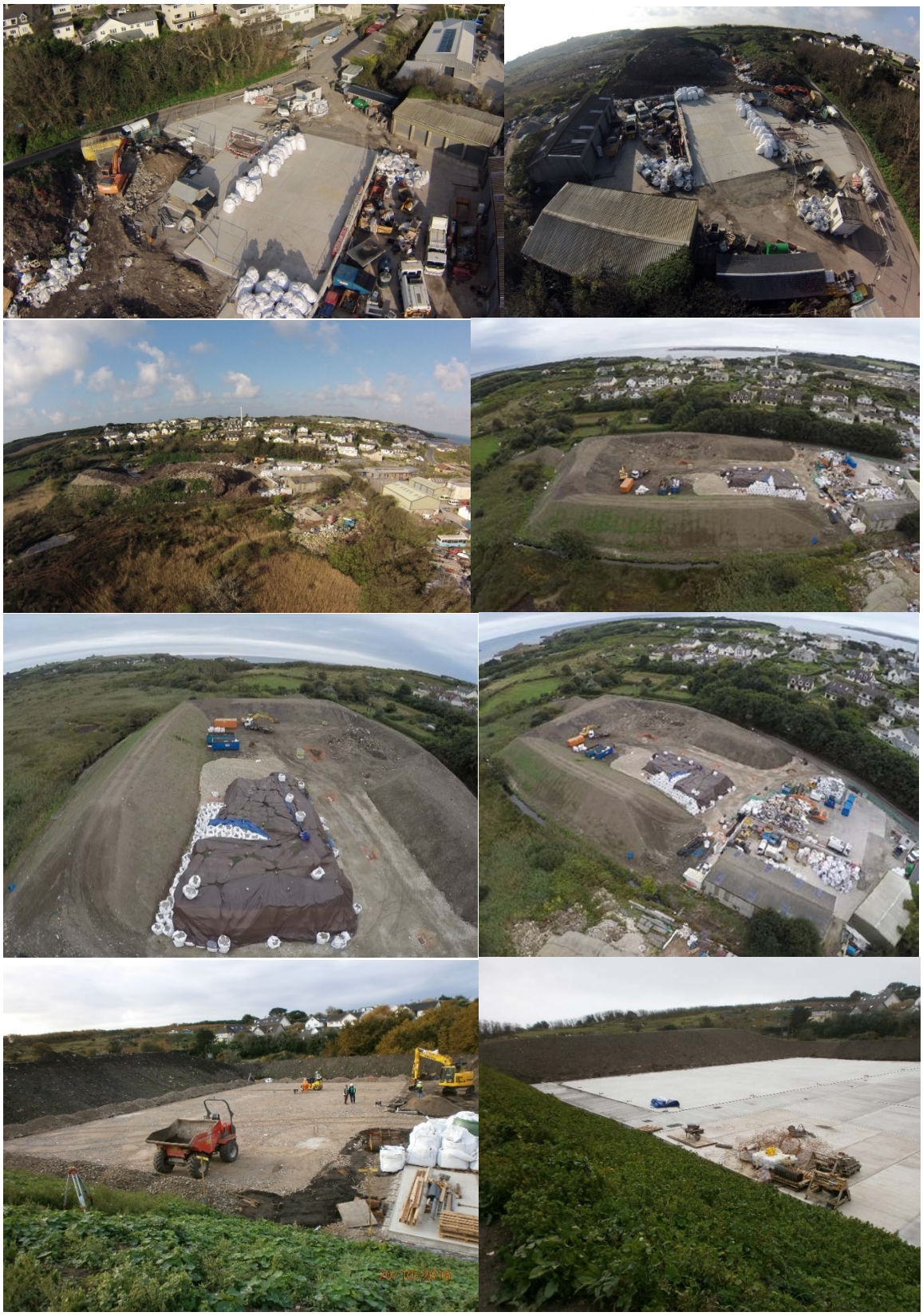

Figure 9 Images Evolution of the Redevelopment of the Waste Site at Porthmellon, Source Images Credit: Merryn Smith

Drinking Water

59. **Introduction** The Council of the Isles of Scilly is the only Local Authority that functions as a Water Authority in England and Wales, providing drinking water to around 1070 domestic properties and various business on St. Mary's and Bryher. Drinking water on Tresco is managed and supplied by the Tresco Estate. Drinking water on St Agnes and St Martins are provided by the Duchy of Cornwall Estate or through private supplies.

60. **Existing Context of Water Management** The water environment of the islands is important for a number of reasons, not least its ecological value and as a source of drinking water for the islands' residents and visitors. With the exception of a desalination plant on St Mary's, drinking water on the islands comes from the ground. Overall, the aquifer characteristics are likely to be similar across the islands, with primary permeability drift units overlying a secondary permeability granite system. Much of the area is characterised by thin soils, which provide limited attenuation to contaminants, making the groundwater potentially sensitive to pollution. The drift deposits are mainly thin and therefore, where this is the case, their main role is to provide a medium enabling fairly rapid recharge to the underlying granite bedrock, with little runoff or shallow subsurface flow within the drift.

61. Within the granite, fracture flow is the dominant mechanism with permeability is controlled by the degree of weathering and fracturing and therefore linked directly to depth. Fracture flow within the solid granite may be relatively fast, with little attenuation of potential pollutants. Storage is primarily within the joints and fissures, and hence abstraction wells are likely to display rapid dewatering if groundwater levels are drawn below the main fracture network.

62. St Mary's Drinking water supplies are generally good and consists of five groundwater wells; three (Carrs, Venns and Hales) in the Higher Moors area; and two wells in the Lower Moors area (Joanney's' and Rocky Hill). Some of these sources are located in environmentally sensitive areas and are prone to surface water inundation with little protection provided by the head works.

63. The water supply for St Mary's is supplemented by a desalination plant that was upgraded in 2012 following the replacement of the original plant. Currently the desalination plant provides around a third of drinking water through a reverse osmosis process and is located on the eastern side of the island above Pelistry Bay. The desalination plant is used to improve the quality of the ground water, which is high in nitrates and arsenic, and helps the groundwater levels to re-charge and reduce the risk of saline intrusion.

64. Due to the size of the plant and intake there is a limit to the amount of water that can be treated (at present the maximum yield is around 250 m^3 per day although it has the potential to produce 400 m^3). Desalination is an expensive form of treatment due

in part to its energy requirements. As the cost of desalination has to be passed on to the customer, it is not currently economically viable to produce all of drinking water on St Mary's in this way, although the installation of solar PV panels installed by Natural Generation on behalf of Hitachi as part of the Smart Islands programme will help reduce costs and may make it a more economically viable treatment method.

65. As a result of the poor performance of the 6 cliff-side boreholes, a direct seawater intake[8] was identified as a requirement to ensure sufficient raw water. The initial design required a significant amount of engineering and construction and the costs were high. Additionally, the long lead time to develop the project meant that it was necessary to consider an interim alternative.

Figure 10 St Mary's Desalination Plant

66. While designing an interim arrangement, the Water team identified a permanent solution that would combine the long term solution with the lighter touch of a temporary intake (see fig 2). The new intake provides the additional sea water required to meet seasonal demand, but can be decommissioned in the winter months when the cliff-side boreholes provide an adequate supply of sea water for the desalination plant. It has also delivered significant savings through the reduction in use of the expensive filters.

[8] http://committees.scilly.gov.uk/mgConvert2PDF.aspx?ID=15307&ISATT=1#search=%22intake%22

Figure 11 Direct Sea Intake at Pelistry on St Mary's

67. There are three reservoirs on St Mary's all in the form of above or below ground storage tanks. Water extracted from groundwater boreholes or the sea blended, treated and distributed through the mains network via the water pumping and treatment station at Porth Hellick above Higher Moor.

68. The distribution network comprises a mix of pipe materials, some of which needs to be replaced in accordance with Drinking Water Inspectorate (DWI) regulations. The distribution system is generally shallow and therefore vulnerable to damage and low temperatures in winter. The extent of leakage within the network is unclear, although detection and repair work are undertaken on a regular basis. Parts of the distribution system experience low water pressure, particularly in Hugh Town.

69. A small laboratory water pumping and treatment station at Porth Hellick provides facilities for a minimal sampling programme although improvements are required to meet the Water Supply (Water Quality) regulations 2016[9].

70. The Council's Water Quality Officer works in parallel and in partnership with the public water supply operations and also with the private water supplies. The Council is continuing to work towards meeting the water quality standards that will be required under the new legislation and the water quality for St Mary's and Bryher continues to improve.

71. **Bryher** There are five water abstraction boreholes on Bryher that supply fresh water. These are all located just to the north east of Great Pool. Two replacement tanks and sampling facilities have been installed on Bryher to improve the water facilities on the island. The drinking water supplies on Bryher are limited and are vulnerable to loss of supply and water quality issues. There are a number of different raw water sources, each with variable water quality issues. The main well is brackish and sodium chloride levels are twice the drinking water guide value. One of the sources contains naturally arising lead giving rise to a risk of failing the health based standards. Some of the sources are located in environmentally sensitive areas, being close to or within Sites of Special Scientific Interest (SSSI) and are prone to surface water inundation with little protection provided by the head works.

[9] http://www.legislation.gov.uk/uksi/2016/614/contents/made

72. In 2012 the water mains on Bryher were upgraded as part of the £1.5 million grant from DEFRA to improve the quality of drinking water supplies on the island of Bryher. More recent improvements to the quality of drinking water on Bryher has focused on improving conductivity levels and reducing the level of sodium. Working closely with the DWI and on the basis of their advice, additional treatment has been installed in the form of nano-filtration (low pressure reverse osmosis) to reduce conductivity and chloride levels. Treatment by nano-filtration has an important advantage because the power requirements are approximately half of those for high pressure reverse osmosis as per St Mary's (typically 2 - 3 KWh compared to 4 - 6 KWh). However, this process does lead to a loss of water.

73. The two storage tanks have recently been refurbished but further improvements are required to increase the integrity of the system and reduce opportunities for contamination of the system post UV disinfection. The drinking water network is very shallow with a mix of materials with an unknown level of leakage.

74. **Consumption on St Mary's and Bryher** As water supplies remain adequate and plentiful outside of the summer season it is considered that the resident population of the islands does not place an unacceptable burden on the islands public water supplies on Bryher and St Mary's. However population increases due to high numbers of visitors during the drier summer months does place pressure on ground water supplies. The demand for water on St Mary's during the summer months is around 700m^3 per day of which 250m^3 or 36% of the total is supplemented by

desalinated seawater. As indicated in the tables below the demand for water in the winter months is considerably less.

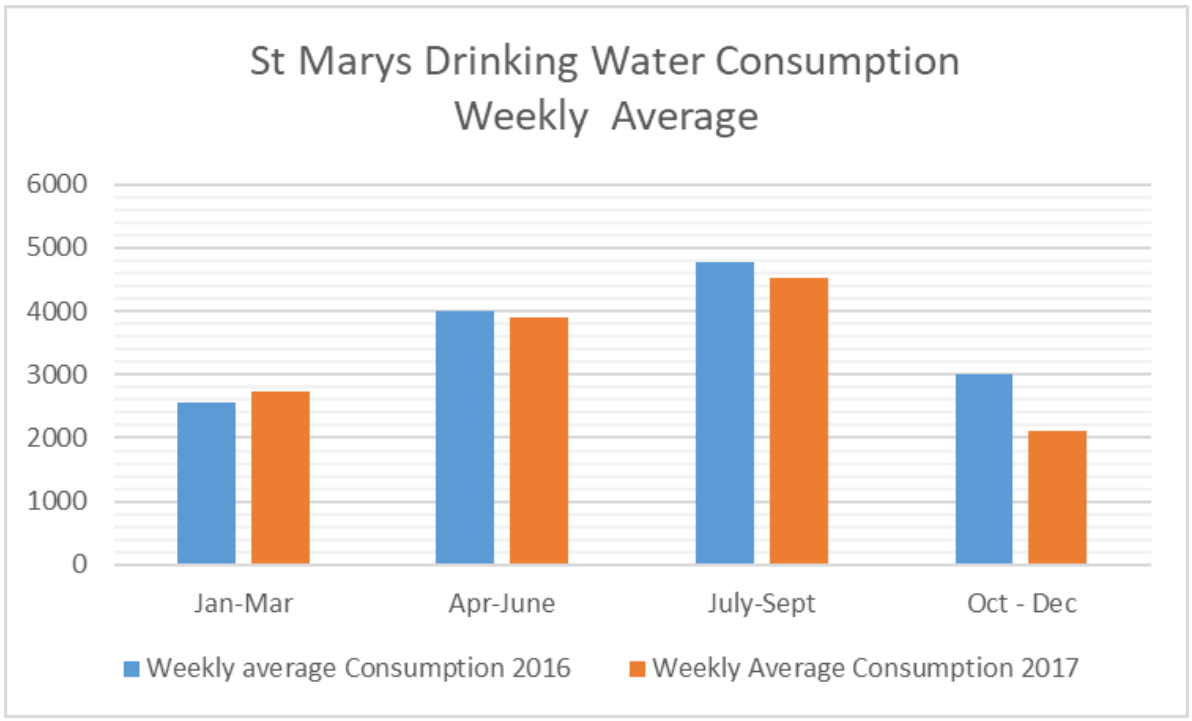

Figure 12 Table of Average weekly water consumption on St Mary's 2017 and 2018

St Marys	Weekly average Consumption m^3 2016	Weekly Average Consumption m^3 2017
Jan-Mar	2556	2739
Apr-June	3992	3913
July-Sept	4771	4522
Oct - Dec	2998	2122

Figure 13 Table of average weekly water consumption on St Mary's

Council of the Isles of Scilly	
Per head daily average (non-metered):	**200 litres per day**
National per head daily average (non-metered):	**162 litres per day**

Figure 14 Comparison between Water Consumption on Scilly and the National Average

75. In the long term, it is proposed to meter all properties on the islands as this has been seen to achieve the best results in reducing consumption. Domestic metering on Bryher and St Mary's is not economically viable at present and is dependent on future investments once the Water Industry Act and other legislation is applied to the islands. Reducing water consumption is a key aim of the Local Plan with the objective of maintaining a sustainable community.

76. During the summer of 2018, which witnessed particularly hot weather with very little rain, the islands of Bryher and St Mary's were hit with significant water shortage issues. During this period, groundwater supplies were reduced to a historically low

level due to the groundwater being abstracted at an unsustainable rate. Demand has been carefully managed downwards and the risk of long term damage to water resources through over abstraction has been an area of much concern.

77. In addition to continual campaigning, in response to the stretched water resources the following improvements have been made to improve the capacity and reliance of water supplies:

- Provision of a back-up generator to ensure that the desalination plant could operate continuously;
- The upgrading of the electricity cable that runs from the desalination plant down to the seawater intake – this was at the end of its' life and failure of this cable was identified as a critical risk which we needed to mitigate. The upgrade will also enable the future capacity of the desalination plant to be increased.

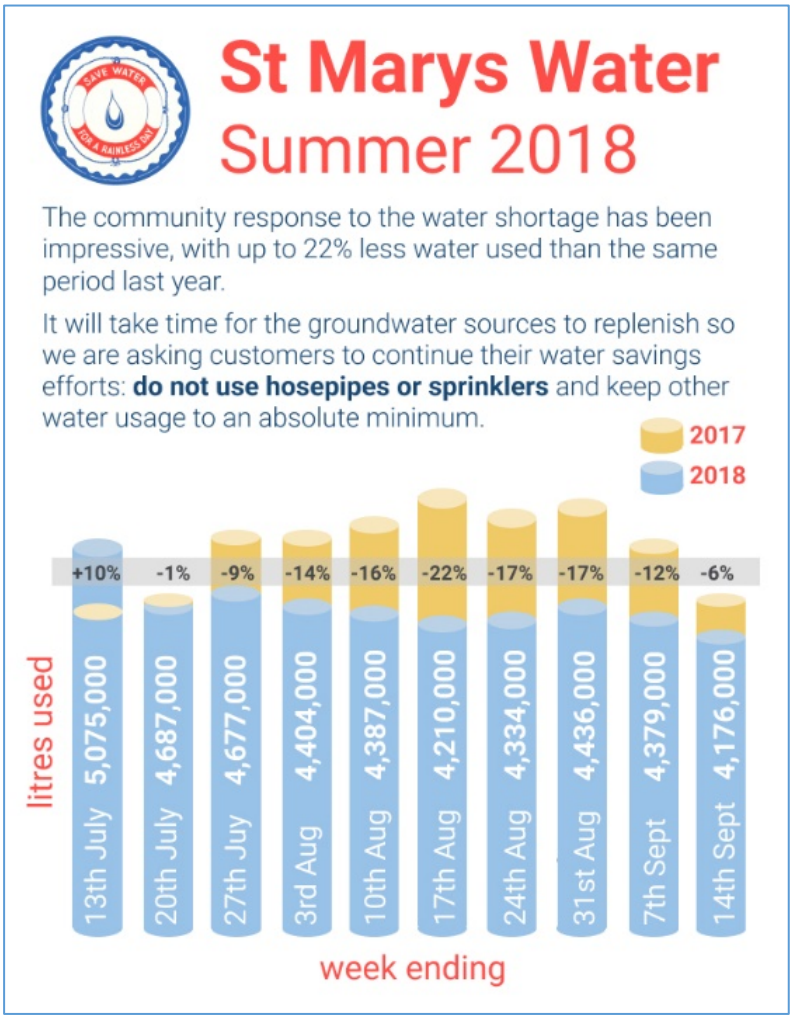

Figure 15 Figure 16 Publicity material circulated to the community during the summer 2018

78. **Tresco** Tresco Estate supplies drinking water via a whole-island distribution system that includes appropriate blending and treatment. Water services on Tresco are considered to be well maintained and managed comprising four groundwater sources treated and disinfected by UV light. The distribution network is primarily comprised of a modern plastic/MDPE network. Storage is in above ground fibreglass sectional tanks or round poly plastic tanks. The Estate also operates strict exclusion zones around its boreholes to mitigate the risk of any contamination of the water supply.

79. **St Agnes & St Martins** On St Agnes and St Martins, drinking water is provided through a combination of the Duchy of Cornwall Estate and private boreholes with waste water disposed of through private treatment plants, mostly in the form of septic tanks. Water supply on St Agnes is sourced from Big Pool SSSI in the North West corner of the island, protected from the north and west by sea defences. St Agnes depends on the aquifer for its fresh water supplies via borehole abstraction. The water supplies on St Martins are drawn from private boreholes, supplemented with rainwater collection tanks. Borehole water supplies on both St Agnes and St Martin's are vulnerable to pollution from agricultural chemicals and septic tank seepage.

80. There are six borehole sources on St. Martin's and four on St Agnes that supply the Duchy of Cornwall's water supplies. These boreholes have little protection to prevent inundation or to provide an adequate level of security. None of the abstractions are licensed or have been tested for reliable yield. There is little automation or on-line control other than dry run protection for the borehole pumps. Generally, raw water is pH corrected, filtered and then UV disinfected before storage with treatment works that remove nitrates before pH correction. Before distribution the water is further filtered and another UV dose applied.

81. St Agnes and St Martin's Highertown treatment works provide nitrate removal before pH correction. St Martin's also has an activated carbon filter before pH correction. The two storage tanks at St Agnes and the three tanks at St Martin's are relatively new. A new distribution system has been installed on St Agnes.

82. There are 30-40 other private supplies on these islands. Private water supplies on the islands are at risk of contaminations from nearby septic tanks. The Environment Agency (EA) and DWI have been investigating the scale and extent of these risks and have been advising the owners of these private supplies.

Waste Water

83. **St Mary's** The Council operates the public mains sewerage on St Marys for around 800 properties through two separate systems, one serving Hugh Town and the second in the immediate surrounding area known as Old Town. The only permitted discharge is at the Atlantic Hotel Combined Sewer Overflow (CSO), on the Hugh Town system. Sewerage infrastructure includes the Bio-bubble treatment plant at Old Town, a pumping station to the rear of the Bishop & Wolf pub in Hugh Town and the main outfall at the Garrison. There is also a small-scale independent system at Telegraph.

84. **Water & Sewerage Costings**

	Water & Sewerage		Drinking Water
YEAR	Expenditure (excluding depreciation)	Income	St Marys Consumption
2013 - 14	£635,223	£562,937	174,264m^3
2014 - 15	£788,402	£584,334	172,966m^3
2015 - 16	£619,814	£736,914	172,013m^3
2016 - 17	£720,338	£729,332	189,017m^3
2017 - 18	£788,006	£749,526	185,293m^3

Figure 16 Expenditure and income for Water and Sewerage and Drinking water

85. **Old Town sewerage network** The Old Town system comprises gravity sewers and a sewage treatment works (a Bio-bubble Plant) commissioned in 2001 to provide full biological secondary and tertiary treatments (through ultraviolet disinfection) before discharge through a short sea outfall pipe, there is also a sewage pumping station and rising main that still connects into the Hugh Town system for the disposal of liquid sludge from the Bio-bubble plant. Sludge from the bio-reactor is pumped into the Hugh Town system for disposal via morning point on the Garrison. The Bio-bubble has been adversely affected by saline ingress generating hydrogen sulphide and is prone to blockages, prior to tertiary treatment with UV disinfection.

86. The Old Town area was connected to the Hugh Town system in 1963 by means of a rising main which enters the Hugh Town system outside the old secondary school. Additional flows were connected in the Jackson Hill area of Hugh Town in the late 1960's. The Jackson Hill flows are pumped into the Hugh Town network from a pumping station adjacent to the Council Depot.

87. **Hugh Town sewerage network** The Hugh Town system comprises a sewerage network, several sewage pumping stations and a rising main to a short sea outfall pipe fractured at Mean Tide Level, where crude sewage is discharged into the Atlantic Ocean off Morning Point, located to the south of the Garrison. The majority of the foul sewerage network in Hugh Town was laid in 1939 as a gravity system.

88. The sewer network is a foul and surface water combined system and collects surface water runoff and roof drainage. The extent of this sewerage network in Hugh Town totals approximately 3km, including 327m of surface water sewer. The physical extent of the gravity sewer system extends from Star Castle Hotel on the Garrison in the west to the Industrial area and residential properties in the Porthmellon area in the east. The most southerly points served by the Hugh Town sewer network are the Health Centre on Church Road. The foul system within Hugh Town is mainly 150mm diameter and is of clay construction.

89. The Bishop and Wolf pumping station has two shaft-driven pumps with automated changeover. The pumps are controlled by level sensors located within the wet well. Under normal flow conditions, one pump is adequate to handle incoming flows.

90. The collected flows from the Hugh Town catchment are pumped from the Bishop and Wolf pumping station via a rising main to the Garrison and then discharged off Morning Point, to the south.

91. The surface water system pre-dates the foul system laid in 1939 and the records for this system are incomplete. The recorded lengths of surface water sewer total 327m in length with the largest pipe diameter recorded as 450mm. The surface water sewer has an outfall at Town Beach close to the Atlantic Hotel. This arrangement allows high foul flows in the system to discharge from the foul network via a rough screened weir into the surface water sewer to discharge on the Town Beach via the Atlantic Hotel outfall. An emergency overflow (EO) discharges into the main harbour and Hugh Town Beach from an open ended pipe protruding through the wall of the Mermaid Inn designed to prevent flooding.

92. The network is shallow with slack gradients and prone to ragging, blocking with fats, oils and greases (FOG) and build-ups of sand siltation. The Council own and operate a high pressure water jetting system to clear blockages (as the sewer network is subject to blockages), the incidence of which has been reduced using fat digesting enzymes. The causes of blockages are primarily to fat build up or sewer misuse from the disposal of large sanitary items into the network.

93. The enzyme dosing work is focused on the section of sewer network called the Mermaid run. The inadequacies of the system in this locality are exacerbated by poor flow due to flow restrictions arising at Manhole 4 (at the junction of Hugh Street and Garrison Lane), where flows from the Mermaid run meet flows from Church Street and The Strand.

94. **Tresco** Tresco Estate manages waste water for the island. The sewage treatment works has basic screening and discharges through a long sea outfall. The main

pumping station has a CSO. The heliport and three other properties are served by a small septic tank and soakaway.

95. **Bryher, St Agnes and St Martins** On Bryher, St Agnes and St Martin's private septic tanks are used. On St Agnes a central bio-bubble services the St Agnes Island Hall. The main consideration for both existing and new developments on the islands is to reduce the risk of water resources contamination. Through improved treatment and management and asset refurbishments/replacements. Current waste water facilities are all private and are predominantly septic tanks with soakaways serving either individual properties or a small group of properties. Sludge from the septic tanks is disposed of to land on the islands. Across St Martin's & St Agnes there are around 20 wastewater assets within 50 metres of an in-use private supply. Many older to-land discharges are made via a single point of discharge rather than an engineered soakaway.

96. **Future Options for Drinking Water and Waste Water Management** The Department of Environment, Food & Rural Affairs (Defra) launched a consultation in 2015 on their intention to introduce water and sewerage legislation relating to the Isles of Scilly. Currently legislation including the Water Industry Act 1991[10] and Water Resources Act 1991[11] do not apply to the islands.

97. In response to the initial consultation, the Council of the Isles of Scilly welcomed the application of the legislation as they would they provide benefits to public health and the environment consistent with the rest of the UK and the EU. The regulators DWI and the EA will be given regulatory and enforcement powers on the islands, equivalent to the mainland. However, as a result of under-investment in essential infrastructure and the challenges of providing services on the islands, the financial and practical implications of the application of legislation on the islands would be profound. The investments required to improve services and infrastructure to meet public health and environmental standards would be substantial and, for example, effectively require the Council to rebuild its sewerage infrastructure with similar investments required by other water suppliers across the islands. The Council estimated the cost to run into tens of millions of pounds, well beyond what the islands' small number of bill payers could collectively afford and potentially threatening the viability of living and working on the islands.

98. The response from Defra to the initial consultation was positive resulting in the formation of a working group to find realistic solutions to enable compliance with the legislation. It was also recognised that more time would be required before legislation could be applied to the islands.

99. In March 2016, Defra wrote to all water and wastewater companies inviting them to submit expressions of interest in running the water and wastewater services on the Isles of Scilly. South West Water (SWW) responded positively confirming the company's interest. It was the only positive response received by Defra. Since then,

[10] http://www.legislation.gov.uk/ukpga/1991/56/contents
[11] http://www.legislation.gov.uk/ukpga/1991/57/contents

SWW has been assessing the condition of the water and wastewater infrastructure on the islands and developing a business plan for the Isles of Scilly to submit to the Water Services Regulation Authority (Ofwat) and the working group.

100. The working groups preferred solution is for a licensed water company, SWW to extend its licence to include the Isles of Scilly and make the required significant investments to improve quality and ensure compliance with the appropriate legislation. This approach has been agreed by the Minister for the Environment, and the draft business plan has also received the support of Pennon Group Plc, owners of SWW.

101. Before SWW can operate on the islands, two elements need to be enacted. The first is that the Water Industry Act 1991 has to be amended to include the Isles of Scilly and is laid before Parliament for approval. The second stage of this process is for SWW to make a formal application to Ofwat, to extend their licence to include the Isles of Scilly. This application will include an Ofwat-led consultation phase, planned for later this year, to ensure that the proposals are fair to residents of the Isles of Scilly and to existing South West Water customers. The consultation will be an opportunity to review and comment on SWWs proposed plans for operating on the Isles of Scilly.

102. Subject to agreement from Ofwat and the application of Water Industry Act, it is anticipated that SWW licence would be extend to include the entire islands by April 2020.

103. SWW has prepared a business plan setting out the operational and investment requirements to provide the necessary improvements in water and wastewater services on the islands to comply with legislation and meet the standards expected by both the DWI and EA. The investment plans indicate a requirement for around £50m to be invested up to 2030 across all of the islands, with around £35m identified for up to 2025.

104. For each island, the objective is to ensure all drinking water and waste water infrastructure and services complies with the appropriate legislation to ensure expected public health and environmental standards are maintained. Specifically in relation to drinking water, the objective is to provide a safe, reliable and sustainable supply of water with more stable and balanced pressures across the entire island, reduced leakage and fewer supply interruptions. In relation to waste water, the objective will be to make improvements that provide reliable and safe disposal of wastewater that works with the natural environment to achieve improved water quality. Specifically for St Mary's a significant investment will be the construction of a new wastewater secondary treatment works to treat sewage from the Old Town and Hugh Town systems, with extensive remedial work and asset replacement for the network to meet the legislative requirements, including a new rising main from a new pumping station to the treatment works.

105. As part of the planned improvements, research is being undertaken to improve the sustainability of the islands water resources to optimise the use of existing raw water sources and determine reliable yields of the islands aquifers and boreholes.

106. Common themes that will need to be delivered as part of the future improvements and investments to both drinking water and waste water include:

- provision of a sampling and analytics programme to comply with the regulations, including Environmental Permitting Regulations and the Urban Wastewater Treatment Directive;
- installing an inter-island telemetry system that has the future potential to benefit from, and complement, the smart islands programme;
- appropriate staffing to support management and operational structures;
- improving the security of supply with all water sources assessed for reliable yield to inform Water Resource Management Plans (WRMP) and Drought Plans.

107. Consistent with the Smart Islands programme, the islands are an ideal location for innovation and the opportunity to invest in new and emerging technologies, which would not always be economical on the mainland. Such innovation could include the co-digestion of sewage sludge and food waste through advanced anaerobic digestion, which would contribute to the creation of a more affordable and sustainable solution to managing waste on the islands. Other benefits of co-digestion include energy generation and digestate use as a fertiliser.

108. The emerging IT infrastructure being developed through the Smart Islands Programme provides the opportunity to support full coverage of mobile technology dependent solutions such as automated customer meter readings, real-time meter readings and automated leakage alarms based on unusual demand patterns.

109. **Future Growth Implications for Drinking and Waste Water Management** The emerging Local Plan is planning for very modest levels of development over the plan period. Over the past decade, the islands have experienced both a decline in its resident population and the number of visitors. Based on the strategy set out in the Local Plan, any increase in the population of the islands by 2030 is likely to be marginal compared to the peak population in 2008. Similarly, it is unlikely that the strategy of the Local Plan in itself will mean that visitor numbers will increase to the levels experienced at the start of the millennium. Based on the SHMA, including the updated work, the current population of 2,259 would be expected to increase to around 2,410 by 2030 as a consequence of the housing strategy set out in the Local Plan, an increase of around 150 (7%). Whilst it is difficult to predict future visitor numbers and the Local Plan provides a development framework to support the Destination Management Plan, it is not anticipated that visitor numbers will reach the levels of over a decade ago, over the plan period to 2030.

110. Given the significant investments and improvements planned to both drinking water and waste water infrastructure and services on the islands to comply with legislation

and meet the requirements of the DWI and EA, it is considered that there will be sufficient capacity to accommodate the amount of sustainable growth of the islands water management proposed by the Local Plan. Of particular relevance in understanding any impact arising from the Local plan is that these investments and improvements will be required regardless of any planned future growth on the islands to address an under investment in infrastructure and ensure it is fit for purpose and meets the required environmental and public health standards.

111. As set out in the sustainability policies of the Local Plan, all new development will only be permitted where it is supported by the necessary existing or planned infrastructure to enable its delivery. In addition, sustainability policies will require new development to implement modern and innovative design measures and systems that will reduce consumption and use, including limits on water usage, water harvesting and water recycling.

Local Plan Recommendations

112. To take advantage of existing and planned investments in infrastructure, the Local Plan requires housing development to be strategically planned particularly in the case of for St Mary's and focused on those areas where connections to existing or planned infrastructure can be made without significant costs. As such, the strategy of the Local plan focuses most development in both Hugh Town and Old Town as the most suitable and sustainable locations.

CIOS Infrastructure	Current Status 2018	Capacity	Planned Maintenance/ Investment	Impact of the Local Plan
Waste and Recycling (Domestic and Commercial)				
Porthmellon Household Waste and Recycling Centre (HWRC)	Recent redevelopment of the site, since 2014, has seen the demolition of the aging incinerator and the remainder of the site turned from an illegal landfill site into a HWRC and waste transfer station.	Sufficient capacity for all islands waste as residual waste and mixed recyclables are sent to the mainland. Glass, inert aggregate, and green waste are recycled on-island. Inert material is recycled at Pendrethan Quarry and green waste composted at parting Carn, both by private businesses.	Exploring options for managing organic waste streams on the island (primarily food waste and potentially sewerage slurry) using AD or in-vessel composting along with a thermal treatment process.	Potentially up to 150 new dwellings could come forward during the plan period. Negligible impact on current operations given the shipment of waste and recylates to the mainland. Existing collection rounds/vehicles and staff can incorporate the planned additional dwellings. No specific new allocations for waste sites.
Off Island Waste Management Sites: St Agnes, Bryher, St Martins	Off island waste management sites are managed through contracts with the Council.	Sufficient capacity to deal with likely growth on each off-island.	Explore options for managing waste on each off-island, including organic waste streams.	No planned development on the off islands.
Fresh Water Network				
Public Water Supply	Currently, the public drinking water supplies on St Mary's and Bryher are operated by CIOS. On Bryher, water is abstracted from several boreholes and a well. This is treated and blended to deliver potable water. On St Mary's, drinking water is from a mixture of groundwater and seawater sources.	The desalination plant can currently supply 40% of peak demand on St Mary's. The summer of 2018 demonstrated the vulnerability of the groundwater sources in periods of hot dry weather. Therefore sort term plans are in place to increase the seawater yield.	Long term significant changes are anticipated for water and sewerage delivery across all the islands. This will include application of environmental legislation and regulation that the islands have been exempt from. To comply with the requirements of water legislation and based on existing infrastructure, it is likely	Potentially up to150 new dwellings could come forward during the plan period. Requirements to build water efficient homes will limit impact on drinking water resources,

CIOS Infrastructure	Current Status 2018	Capacity	Planned Maintenance/ Investment	Impact of the Local Plan
	The desalination plant is fed from a direct seawater intake between April and October, and from Cliffside boreholes over the winter.	Long term plans to decrease consumption includes wider installation of water meters, provision of water saving devices and improvements to the network to reduce leakages. The biggest strain on the existing resources and infrastructure is from a significant increase in demand as a result of an influx of visitors during the peak summer season.	that operations will transfer to a private water company and it is estimated that around £50m of investment (across water and sewerage on all islands) will be made over the next 15 years. Short term, improvements to the capacity of the desalination plant are planned to allow for a higher maximum capacity should the groundwater sources be stressed.	
Sewerage Network				
Public Sewerage, St Mary's	The existing Old Town Bio bubble requires repairs to be fully operational, but otherwise is adequate for short term treatment of Old Town Sewerage. The aging sewerage pipe network in Hugh Town is subject to regular blockages and failures. The main discharge at Morning Point discharges raw, untreated or screened effluent into the sea.	The existing infrastructure struggles to meet existing demand at peak times, largely as a result of additional strain placed on the system by tourists and visitors. Further growth of the resident population will be small in comparison to these numbers, but significant investment and improvements are required and planned for to meet the social and economic needs of the islands.	It is likely that operations will transfer to a private water company and it is estimated that around £50m of investment (across water and sewerage on all islands) will be made over the next 15 years. Short term, improvements to the Bio bubble in Old Town are planned to ensure that it is able to meet demands until new infrastructure/treatment methods are established.	Requirements to build water efficient homes will limit impact on drinking water resources. The resident population and a moderate increase on that is not anticipated to place an additional or unsustainable burden

Glossary of Terms

Term	Description
AD	Anaerobic Digester
CSO	Combined Sewage Overflow
DWI	Drinking Water Inspectorate
EA	Environment Agency
EO	Emergency Overflow
HWRC	Household Waste and Recycling Centre
LCN	Landfill Closure Notice
LCP	Landfill Closure Plan
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
Ofwat	The Economic Regulator of the water sector in England and Wales
SHMA	Strategic Housing Market Assessment
SLR	SLR Environmental Consulting Service, contracted by the Council of the Isles of Scilly to produce a Waste Strategy.
STW	Sewerage Treatment Works
SWW	South West Water
WAMITAB	Waste Management Industry Training Advisory Board
WCA	Waste Collection Authority
WDA	Waste Disposal Authority
WDP	Waste Disposal Plan
WRP	Waste Recovery Plan
WS	Waste Strategy